

REMARKS/ARGUMENTS

Claims 1-10, 12, 14-21, 23-32, and 34-36 were pending in the application. Claims 2-9, 15-21, 23, 25-27, and 29-31 were withdrawn. Claims 1, 10, 12, 14, 24, 28, 32, 34-36 were rejected. No claims were merely objected to and no claims were allowed. By the foregoing amendment, claims 24 and 36 are canceled, claim 1 is amended, and claims 37-41 are added. No new matter is presented.

New claims 37 and 38 are supported by page 9, line 28 and page 12, line 27. New claim 39 is supported by page 8, lines 24 and 25. New claim 40 is supported by page 7, line 20. New claim 41 is supported by page 9, lines 13, 14, 18, and 19.

The identified grain size of former claim 24 (now canceled) has been incorporated into claim 1. For clarification, it is identified that the monitoring occurs during the spraying operation. Support for this is found in as-filed claim 1 (see IPER) and page 3, line 26 and page 6, line 1. The reference to responsive control has been incorporated from former claim 36 (now canceled). A layer thickness range is supported at page 12, line 27 and page 9, line 28.

Claim Rejections under 35 U.S.C. 103

The Examiner rejected claims 1, 10, 12, 14, 24, 28, 32, and 34 as being unpatentable over Inoue et al. (US 5,143,746) in view of Savkar et al. (US 5,047,612) and Moreau et al. (US 5,180,921). Applicant respectfully traverses the rejection.

Inoue et al. discloses formation of magnetite coatings having "thickness exceeding 300 μm " with examples of 150 μm , 400 μm , and 500 μm . Col. 4, lines 4 & 5 and Tables 2 and 3. Although technically overlapping the claim 1 and 37 ranges, the §103 teachings are toward thicker coatings outside the claim 38

range. Although the use of the presently-claimed control system may produce thicker layers within the Inoue et al. range, it may also produce thinner layers. That the thickness ranges may overlap does not constitute a disclosure of or a suggestion to adopt the presently claimed control methods. Rather, the limited overlap is regarded as either teaching away from a need to adopt the present control methods or as an inability of the art to achieve the thin layers until the present control methods. The present control methods identify and enable a broader range. The problems of depositing thin layers are discussed in further detail below. Similarly, Inoue et al. identifies a narrow compositional range.

Depositing thin uniform layers is a technically complex problem. If the spray temperature is too low, particles will maintain their structure upon impact and will not uniformly integrate. To provide thin layers, particle speed has to be relatively high (see present Example 4). With high speed deposition, the kinetic energy is transformed into thermal energy producing the melting. However, the high kinetic and total energy poses the risk of splashing creating surface irregularities rather than the uniform structure. It has been determined that with the on-line responsive control, the velocity and temperature may be carefully maintained effective to provide the thin layer uniformity.

The teaching of Savkar is of passive control, i.e. an impact point of the powder is sensed and as a consequence the amount of carrier gas is regulated - however, there is no direct control with regard to properties of the spray such as velocity or temperature.

Moreau teaches to monitor simultaneously the temperature and the velocity of spray particles. However, Moreau's teaching

is not sufficiently specific as to purpose, material, etc. as to suggest the proposed combination. Moreau generally identifies providing a better reproducibility of coating properties or coating quality (Moreau, column 1, lines 48 - 51) rather than expanding the envelope of available prior art coating thicknesses.

The examiner rejected claim 35 as being unpatentable over Inoue et al. in view of Savkar et al. and Moreau et al. as previously applied and further in view of Yoshinaka et al. (US 5,158,643). Applicant respectfully traverses the rejection.

In addition to the reasons noted above, the addition of Yoshinaka et al. is merely more of a hindsight reconstruction against the teachings of the underlying references.

The examiner rejected claim 36 as being unpatentable over Inoue et al. in view of Moreau et al. Applicant respectfully traverses the rejection.

The insufficiency of the basic combination is noted above.

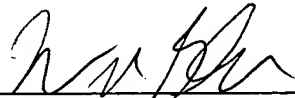
An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.

It is submitted that the claims as amended herein patentably define over the art relied on by the Examiner and early allowance of same is courteously solicited.

If any additional fees are required in connection with this case, it is respectfully requested that they be charged to Deposit Account No. 02-0184.

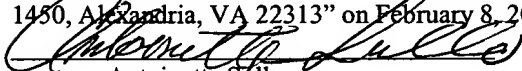
Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: "Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on February 8, 2006


Antoinette Spillo